REMARKS

The Specification is objected to because it contains an embedded hyperlink in page 8, line 7.

By this Amendment A, Applicants have amended the specification by deleting the hyperlink in order to overcome the objection, and the present application is in proper form for allowance.

Claims 1-23 and 26-62 are rejected under 35 U.S.C. §102(e) as being anticipated by Tsukamoto et al. (US 6,498,794).

Claims 24 and 25 are rejected under 35 U.S.C. §103(a) as being unpatentable over Tsukamoto et al. (US 6,498,794) in view of Russell et al. (US 6,496,519).

Claims 1, 4-8, 12, 13, 17, 18, 21, 23, 27, 31, 33-39, 41-43, 45-49, 52, 56, 58 and 59 are hereby amended. Claims 2, 3, 11, 14-16, 22, 28, 30, 32, 44 and 57 are hereby canceled without prejudice. Claims 9, 10, 19, 20, 24-26, 29, 40, 50, 51, 53-55 and 60-62 are original.

By this Amendment A, Applicants' claims clearly show the differences between Applicants' invention and all references of record. Applicants' invention as set forth in the pending claims is, inter alia, based on common time reference (i.e., phase and frequency synchronization) with pipeline forwarding and SONET/SDH that is based on byte-by-byte interleaving or multiplexing of plurality of SONET/SDH channels with only accurate clock frequency (i.e., without phase synchronization).

The synchronous frames in Tsukamoto et al. have only frequency synchronization and not phase synchronization. Applicants' claimed invention establishes using common time reference (CTR) for phase synchronization. Therefore, Applicants' claimed invention is patently distinguishable over Tsukamoto et al.

By this Amendment A, all independent claims and some of the dependent claims are based upon frequency synchronization. The claims as amended further distinguish from other synchronous solutions that are using common time reference. As a result, the present invention is more clearly claimed, while patently distinguishing the claimed invention from mapping of ATM cells to SONET/SDH synchronous frames. Specifically, independent claims 1, 21, 27, 31, 43 and 56 as amended clearly distinguish that Applicants' claimed invention therein is not based

upon frequency synchronization of synchronous frames with byte-by-byte interleaving or multiplexing.

Applicants' claimed invention, as set forth in various ones of the claims, relates generally to a method and apparatus for switching and grooming data units in a communications network in a timely manner while providing low switching complexity and performance guarantees, over a plurality of communications links with a plurality of transmission rates.

In contrast to Applicants' claimed invention, circuit-switching networks—SONET/SDH—(still the main carrier for real-time traffic) are designed for telephony service. Circuit-switching is based on extremely accurate clock frequencies needed (but without phase synchronization) for byte-by-byte interleaving/multiplexing and switching (see multiplexing actual examples in Fig. 62 and Fig. 64 with OC-48). Thus, in SONET/SDT successive bytes belong to different SONET/SDT channels in a repetitive manner. For example: four SONET/SDT channels, Byte 1 belongs SONET/SDT channel 1, Byte 2 belongs SONET/SDT channel 2, Byte 3 belongs SONET/SDT channel 3, Byte 4 belongs SONET/SDT channel 4, Byte 5 belongs SONET/SDT channel 1, and so on. In contrast, in Applicants' invention all the bytes belong to SONET/SDT channel 1 and are in the same SONET/SDH frame are grouped together and are transferred together, i.e., non-byte interleaving (multiplexing) manner (similarly, for SONET/SDT channel 2, 3 and 4).

SONET switches operate according to a reoccurring schedule that, as was mentioned before, is based on a local clock; consequently, data traversing a SONET switch are delayed up to a whole time cycle. Due to byte-by-byte interleaving/multiplexing, the SONET time cycle is the time between the transmissions of two successive bytes of the same channel. For example, the time cycle—hence the scheduling delay—of an STS-1 switch with OC-48 interfaces is $125/48 = 2.6$ μs.

As previously mentioned, byte-by-byte de-multiplexing of STS-N frames into multiple STS-1 frames cannot be done in the optical domain. Consequently, in order to implement SONET-based dynamic optical switching, each incoming byte must be independently switched from input to output. This requires, for OC-192 channels, byte-by-byte optical processing and switching time well below 100 picoseconds, which is far beyond current technology. Since SONET scheduling uses local time measurements, an attempt to overcome the picosecond accuracy requirements by increasing the multiplexed one byte slot size by a factor of x would

imply a factor of x increase in the time cycle, and consequently, in the per switch delay and would cost optical memory.

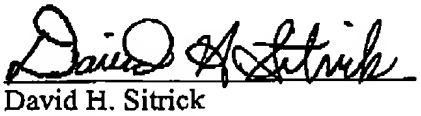
Thus, Applicants' claimed invention is clearly patentably distinguishable over all art of record.

Applicants respectfully submit that all bases of objection and rejection have been traversed and overcome, and that the present application is in proper form for allowance. Reconsideration is requested. No new matter has been added.

The Director has previously been authorized to charge any additional fees and credit any overpayments during the pendency of this application to Sitrick & Sitrick's Deposit Account Number: 501166. No additional fee is due. Reconsideration is respectfully requested.

The Examiner is invited to communicate directly with the undersigned if it would in any way facilitate the prosecution of this Application.

Respectfully submitted,



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